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JC07 Rec'd PCT/PTO 10 JAN 2002

FORM PTO-1390 (REV. 9-2001)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 20496-314	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (If known, see 37 CFR 1.5)	
				10/030668	
INTERNATIONAL APPLICATION NO. PCT/EP00/06633		INTERNATIONAL FILING DATE 12 July 2000		PRIORITY DATE CLAIMED 12 July 1999	
TITLE OF INVENTION DEVICE FOR PUMPING HIGH DELIVERY VOLUMES OF A LIQUID					
APPLICANT(S) FOR DO/EO/US Jan SPRAKEL					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<ol style="list-style-type: none">1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))<ol style="list-style-type: none">a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).<ol style="list-style-type: none">a. <input checked="" type="checkbox"/> is attached hereto.b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))<ol style="list-style-type: none">a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).b. <input type="checkbox"/> have been communicated by the International Bureau.c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.d. <input type="checkbox"/> have not been made and will not be made.8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).					
Items 11 to 20 below concern document(s) or information included:					
<ol style="list-style-type: none">11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.15. <input type="checkbox"/> A substitute specification.16. <input type="checkbox"/> A change of power of attorney and/or address letter.17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).20. <input checked="" type="checkbox"/> Other items or information: PCT International Search Report (in German and English); International Preliminary Examination Report; English language translation of the Reply to Office Action dated August 10, 2001 including claims 1-7 as amended on August 10, 2001; Express Mail Label No. EL616646495US					

U.S. APPLICATION NO. (if known, see 37 CFR 1.45) 10/030668	INTERNATIONAL APPLICATION NO. PCT/EP00/06633	ATTORNEY'S DOCKET NUMBER 20496-314
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21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =	CALCULATIONS PTO USE ONLY <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">\$ 890.00</td> <td style="width: 40%;"></td> </tr> </table>	\$ 890.00	
\$ 890.00			

Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
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CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	7 - 20 =	0	x \$18.00	\$	
Independent claims	1 - 3 =	0	x \$84.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$ 890.00	

<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.	\$	-	
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SUBTOTAL =	\$	890.00	
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Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
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TOTAL NATIONAL FEE =	\$	890.00	
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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +	\$		
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TOTAL FEES ENCLOSED =	\$	890.00	
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	Amount to be refunded:	\$	
	charged:	\$	

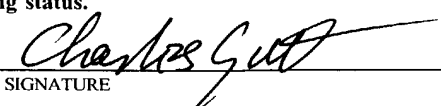
a. ☐ A check in the amount of \$ _____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 16-2500 in the amount of \$ 890.00 to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. 16-2500. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card
 information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO: Proskauer Rose LLP Patent Department 1585 Broadway New York, NY 10036 Phone: 212.969.3000 Fax: 212.969-2900	<div style="text-align: center;">  SIGNATURE </div> <div style="text-align: center;"> Charles Guttman NAME </div> <div style="text-align: center;"> 29,161 REGISTRATION NUMBER </div>
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Date: 10 January 2002

IN THE CLAIMS:


Please note that the claims in the originally filed PCT International application have been amended in accordance with Article 34 EPC on August 10, 2001. The English translation of the amended claims is enclosed herewith. Please consider the claims as they were amended on August 10, 2001.

Furthermore, please amend claims 4-7 of the above-mentioned amended claims to remove their multiple dependencies. A "marked-up" version of the amended claims is enclosed herewith in accordance with 37 C.F.R. 1.121 (c)(1).

- 4. (Amended) A device according to claim 1, characterized in that the planes run parallel, and that the power divider (22) allocated to one plane is coupled with the power divider (18) of the other shaft by a shaft running perpendicular to the respective plane.
- 5. (Amended) A device according to claim 1, characterized in that it has three pumps (4, 5, 6), of which two (5, 6) are arranged in one plane, and the third (4) is positioned in the plane spaced vertically apart thereto.
- 6. (Amended) A device according to claim 1, characterized in that its individual parts are accommodated in a casing whose dimensions correspond to those of a standard container.
- 7. (Amended) A device according to claim 1, characterized in that the pumps are coupled with the drive by means of a crankshaft, wherein the stroke journals are uniformly disturbed around the rotational axis of the crankshaft.

IN THE ABSTRACT:

Please delete the last line, which begins with "Fig. 1 is intended."



Attorney Docket No. : 20496-314

REMARKS

Amendments are being made to claims 4-7 to remove their multiple dependencies.

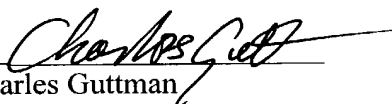
Please proceed to examine the application as amended herein.

Respectfully submitted,
PROSKAUER ROSE LLP
Attorneys for Applicant(s)

Date: January 10, 2002

PROSKAUER ROSE LLP
1585 Broadway
New York, NY 10036

Tel: (212) 969-3000

By 
Charles Guttman
Reg. No. 29,161

Amended Claims - Marked-Up Version

- 4. (Amended) A device according to [one of the preceding claims] claim 1, characterized in that the planes run parallel, and that the power divider (22) allocated to one plane is coupled with the power divider (18) of the other shaft by a shaft running perpendicular to the respective plane.
- 5. (Amended) A device according to [one of the preceding claims] claim 1, characterized in that it has three pumps (4, 5, 6), of which two (5, 6) are arranged in one plane, and the third (4) is positioned in the plane spaced vertically apart thereto.
- 6. (Amended) A device according to [one of the preceding claims] claim 1, characterized in that its individual parts are accommodated in a casing whose dimensions correspond to those of a standard container.
- 7. (Amended) A device according to [one of the preceding claims] claim 1, characterized in that the pumps are coupled with the drive by means of a crankshaft, wherein the stroke journals are uniformly disturbed around the rotational axis of the crankshaft.

4/p_{rt}

SI/ti 990298WO
July 12, 2000

DEVICE FOR PUMPING HIGH DELIVERY VOLUMES OF A LIQUID

The invention relates to a device for pumping high delivery volumes of a liquid, with at least two pumps each forming a single structural unit, which are on the delivery side jointly hooked up to a pressure line, and coupled to a single drive.

Such pumps are used when testing and cleaning pipelines. To test pipelines, they are checked for tightness by „stressing“. In this case, a liquid, e.g., water, is pumped into the pipelines under a pressure exceeding that of the medium to be conveyed in the pipeline during operation. If the pipeline inspected in this way stays tight under a higher test pressure, it is assumed that it will also remain so during operation at a pressure lower than the test pressure.

The length of the section that can be checked during the process of stressing depends on the amount of liquid that can be introduced into the pipeline. The higher the quantity of liquid that can be pumped into the pipeline at the desired pressure, the greater the length of the section that can be checked. The greater the length of the individual sections, the lower the number of stressing processes required for checking a given pipeline section, and the lower the costs associated with inspecting this pipeline section.

Known from practice is a device in which several pumps that respectively form a structural unit are jointly hooked up to a pressure line on the delivery side. This enables a high overall delivery volume for the device in the sum of individual delivery volumes for the individual pumps.

- 2 -

In the known device, high-pressure pumps with as high an odd number of cylinders are used. This makes it possible to minimize the pulsation of conveyed liquid by adjusting the pump stroke of the individual cylinders to each other in such a way that the pulsations resulting from the individual pump strokes mutually reduce or cancel each other out.

As a whole, the known device consists of three modules, a drive unit, a first pump unit and a second pump unit. The individual pumps of the known device are driven by the shared drive. A power divider coupled to the drive shafts of the pumps is connected to the drive. In this case, two pumps are arranged on a shared drive shaft in the first pump unit, while only one pump is provided in the second pump unit.

It has been shown in practice that this device is inconvenient due to the high number of modules and associated space requirement. Pipelines are respectively stressed on site at the individual segments of the pipelines. To this end, the device must be transported to the individual sections of the pipeline. In the known device, this is done by dismantling the device into its individual modules and transporting it module by module to the site.

The object of the invention is to further develop the known device described in greater detail above in such a way as to provide an easily transported and space-saving device.

This object is achieved in a device of the kind indicated at the outset by positioning at least one of the pumps in a plane spaced vertically apart from the plane in which

the respective other pump is located. The vertically spacing makes it possible to stack the individual pumps one atop the other, significantly economizing on space. In addition, the invention makes it possible to combine the individual aggregates of the device into modules. These can simply be transported to the respective site and there be set up in a space-saving manner.

The driving power of the shared drive is preferably distributed to the drive shafts of the individual pumps by a power divider. In this case, it is best if each plane has allocated to it a power divider via which the pumps assigned to this plane are coupled with each other on the drive side, and the power dividers are additionally coupled together, so that the pumps can be connected to the shared drive by one of the power dividers.

In a special embodiment of the invention, the planes can run parallel to each other, and the power divider allocated to one plane can be coupled with the power divider of the other plane by a shaft running perpendicular to the respective plane.

One preferred embodiment of the invention exhibits three pumps, of which two are situated in one plane, and the third is positioned in the plane situated at a vertical distance thereto.

The device is especially easy to transport if their individual parts are accommodated in a casing, whose size corresponds to the dimensions of a standard container, e.g., an ISO 20'' container.

A device of the kind described in the invention optimized to minimize pulsation as much as possible is characterized by the fact that the pumps are coupled with the drive in such a way that each of them executes a pump stroke relative to the respective other pumps shifted by a specific, fixed time interval. In this embodiment, the pump strokes of the individual pumps are harmonized in such a way as to largely avoid a pulsation in the pressure line. Devices according to the invention set up in this way require no more pulsation dampers, and are particularly suitable as devices for stressing pipelines due to the achieved lack of pulsation, and because they are easy to dismantle and transport given the structural distribution of the device according to the invention over several vertical planes. This embodiment of the invention can here be realized in a simple manner by coupling the pumps with the drive by means of a crankshaft, wherein the stroke journals are uniformly distributed around the rotational axis of the crankshaft.

The invention will be explained in greater detail below based on a drawing that shows only a single embodiment. The drawing shows:

Fig. 1 a side view of the device according to the invention;

Fig. 2 a sectional view according to the I-I line on Fig. 1;

Fig. 3 a sectional view according to the II-II line on Fig. 2, and

Fig. 4 a sectional view according to the III-III line on Fig. 2.

Fig. 1 shows a side view of the device according to the invention that forms a single module 1. The module is formed by a frame 2, whose dimensions correspond to those of a standard container. The drive unit 3 and pumps 4, 5, 6 are situated in the frame 2. In this case, the pump 4 is placed on a plane above the pumps 5, 6.

Provided as the inlet for the liquid to be conveyed is an inflow nozzle 7 leading to a filter 8, to which a distribution cylinder 9 is connected. Suction lines 10, 11, 12 lead from this distribution cylinder 9 to the pumps 4, 5, 6.

Situated on the delivery side of the pumps 4, 5, 6 are pressure lines 13, 14, 15, which are routed together in a pressure control valve 16. An outflow nozzle 17 is provided on the pressure control valve 16.

The pumps 4, 5, 6 are driven by the drive unit 3. The drive unit 3 can be an internal combustion engine, and has connected to it a power divider 18 in the plane of the pumps 5, 6. A drive shaft 21 that is provided with couplings 19, 20 and accommodates pumps 5, 6 leads away from the power divider. A second power divider 22 is connected via a perpendicular shaft to the power divider 18, which lies in the same horizontal plane as the pump 4. A coupling 24 connects the pump 4 to this power divider 22 via a drive shaft 23.

The shown device according to the invention is operated as follows:

The drive 3 outputs its drive power to the power divider 18, from which the line is relayed to the drive shaft 21 and the second power divider 22. The drive shaft 21

- 6 -

drives the pumps 5, 6, while the pump 4 is driven by the drive shaft 23 extending from the power divider 22.

The pumps 4, 5, 6 driven in this way draw liquid from the distribution cylinder 9 through their suction lines 10, 11, 12. This distribution cylinder 9 is fed by liquid that passes through the inflow nozzle 7 and the filters 8 connected thereto. The liquid is pumped into the pressure lines 13, 14, 15 by the pumps 4, 5, 6. These empty out in the pressure control valve 16, which controls the pressure of the liquid discharged from the device. Lines (not shown) that route the conveyed liquid into the pipelines to be inspected are connected to the outflow nozzles 17.

The described device provides a compact device for pumping high delivery volumes of a liquid, which can be readily transported due to its slight dimensions.

SI/ti 990298WO
August 10, 2001

CLAIMS

1. A device for pumping high delivery volumes of a liquid, with at least two pumps (4, 5, 6) respectively forming a single structural unit, which on the delivery side are jointly hooked up to a pressure line, and coupled to a single drive (3), wherein at least one of the pumps (4) is positioned in a plane spaced vertically apart from the plane in which the respective other pump (5, 6) is located, and wherein the pumps (4, 5, 6) are coupled with the drive (3) in such a way that each of them executes a pump stroke relative to the respective other pumps (4, 5, 6) shifted by a specific, fixed time interval.
2. A device according to claim 1, characterized in that the pumps (4, 5, 6) are connected with the drive (3) by a power divider (18).
3. A device according to claim 2, characterized in that each plane has allocated to it a power divider (18; 22), via which the pumps (5, 6; 4) assigned to this plane are coupled with each other on the drive side, that the power dividers (18, 22) are additionally coupled together, and that the pumps (4, 5, 6) can be connected to the shared drive (3) by one of the power dividers (18).
4. A device according to one of the preceding claims, characterized in that the planes run parallel, and that the power divider (22) allocated to one plane is coupled with

Amended sheet

the power divider (18) of the other shaft by a shaft running perpendicular to the respective plane.

5. A device according to one of the preceding claims, characterized in that it has three pumps (4, 5, 6), of which two (5, 6) are arranged in one plane, and the third (4) is positioned in the plane spaced vertically apart thereto.
6. A device according to one of the preceding claims, characterized in that its individual parts are accommodated in a casing whose dimensions correspond to those of a standard container.
7. A device according to one of the preceding claims, characterized in that the pumps are coupled with the drive by means of a crankshaft, wherein the stroke journals are uniformly distributed around the rotational axis of the crankshaft.

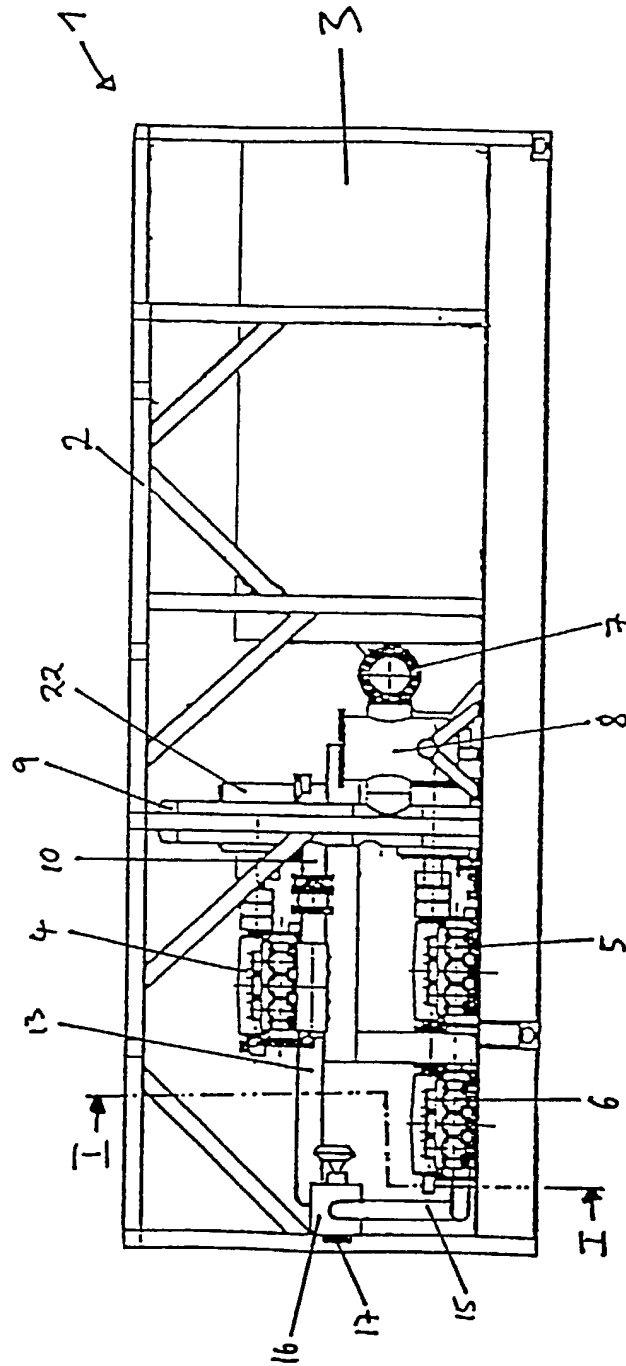
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ABSTRACT

Fig. 1 is intended for the abstract.

Fig. 1 is intended for the abstract.



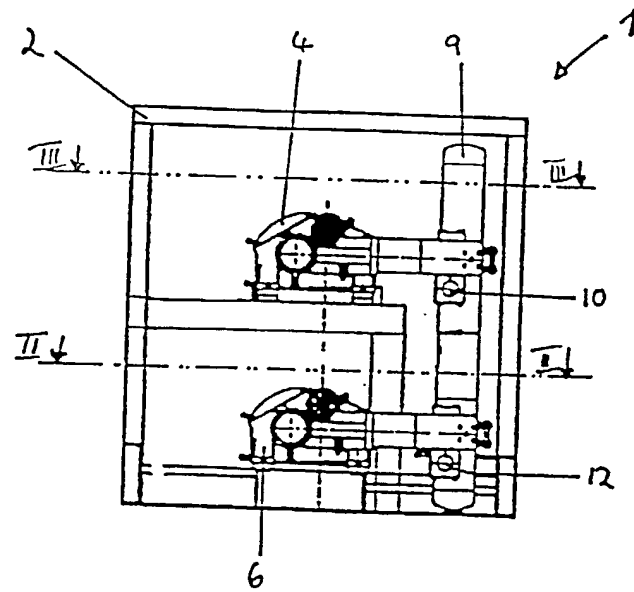


Fig. 2

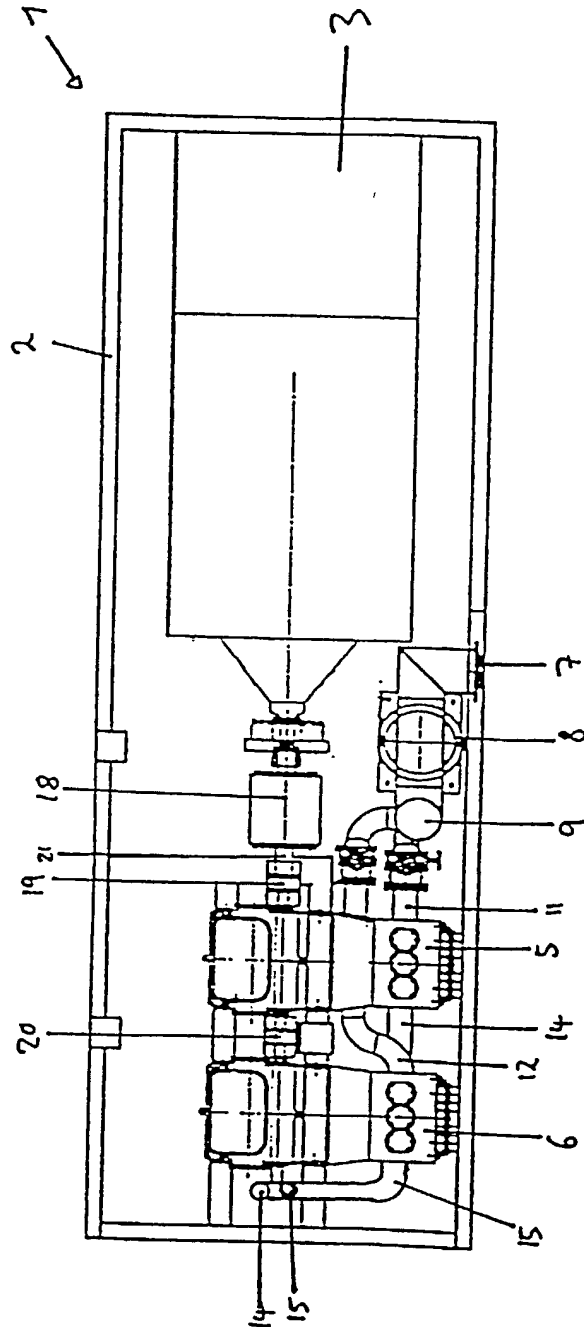


Fig. 3

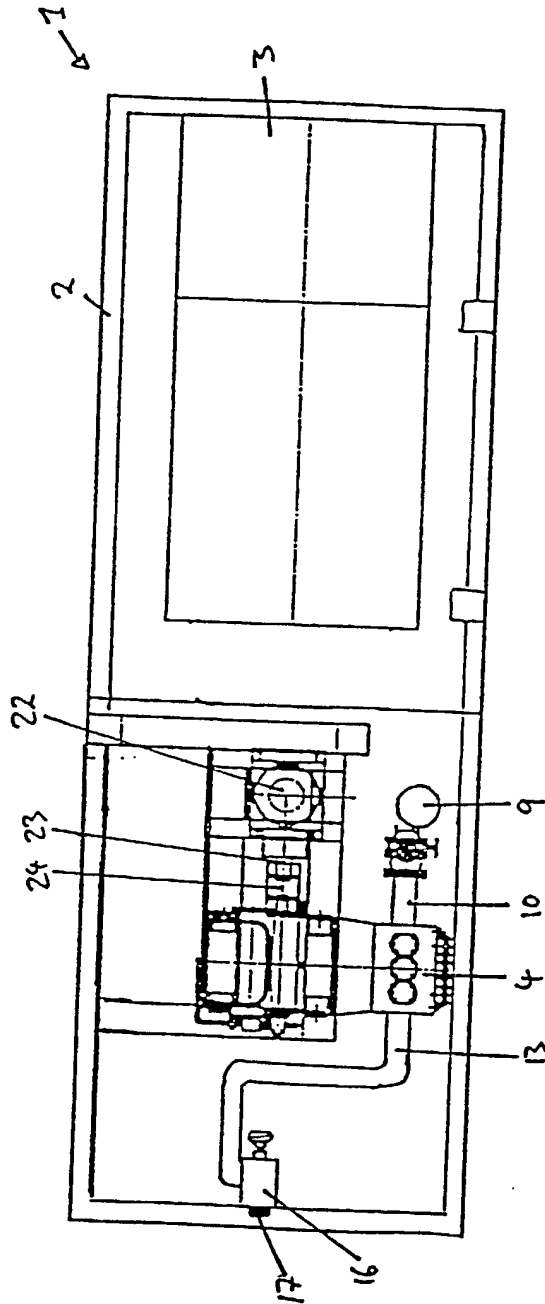


Fig. 4

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter, which is claimed and for which a patent is sought on the invention entitled:

DEVICE FOR PUMPING HIGH DELIVERY VOLUMES OF A LIQUID

the specification of which is attached hereto unless the following box is checked:

 X was filed on July 12, 2000 as United States Application Number
or PCT International Application Number PCT/EP00/06633 and was amended
on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified, by checking the box, any foreign application for patent or inventor's certificate, or PCT International Application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

 199 32 078.0
(Number)

 Germany
(Country)

 12/07/1999
(Day/Month/Year Filed)

(Number)

(Country)

(Day/Month/Year Filed)

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

(Application Number)

(Filing Date)

(Application Number)

(Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application Number)

(Filing Date)

(Status--patented,
pending, abandoned)

(Application Number)

(Filing Date)

(Status--patented,
pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Charles Guttman, Reg. No. 29,161;
Kenneth Rubenstein, Reg. No. 30,586;
Evan L. Kahn, Reg. No. 35,912;
Anthony C. Coles, Reg. No. 34,139;
Gregg I. Goldman, Reg. No. 38,896;
Rachel S. Watt, Patent Agent, Reg. No. 46,186;
Manuel C. Nelson, Reg. No. 44,969;
Tzvi Hirshaut, Reg. No. 38,732;
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Address all telephone calls to **Charles Guttman** at telephone number: **(212) 969-3180**
 Address all correspondence to **Proskauer Rose LLP**
1585 Broadway
New York, New York 10036

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1-90 Full name of the first or sole inventor (given name, family name): <u>Jan SPRAKEL</u>	
Inventor's signature: <i>Jan Sprakel</i>	Date: 11.4.07
Residence: <u>Wermelskirchen, Germany</u> DE	Citizenship: Germany
Post Office Address: Viktoriastrasse 4, D – 42929 Wermelskirchen, Germany	